

Appl. No. 10/603,888
Amdt. dated August 3, 2006
Reply to Office Action of April 7, 2006

PATENT

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1 Claim 1. (currently amended) A device comprising:
2 an I/O connection having a plurality of independently configurable attributes,
3 wherein the I/O connection is adapted to communicate an I/O value and having a configurable
4 attribute;
5 a configuration memory adapted to store a first attribute value that configures at
6 least one the configurable attribute from the plurality of configurable attributes;
7 a diagnostic interface adapted to communicate the I/O value; and
8 a diagnostic controller having a first mode adapted to communicate the I/O value
9 between the I/O connection and the diagnostic interface and having a second mode adapted to
10 receive the first attribute value from the diagnostic interface and to store the received first
11 attribute value in the configuration memory, ~~thereby configuring the configurable attribute of the~~
12 ~~I/O connection~~ wherein the at least one configurable attribute of the I/O connection is
13 configured by the first attribute value.

1 Claim 2. (currently amended) The device of Claim 1, wherein the second mode is
2 further adapted to read a second attribute value previously stored in the configuration memory
3 and to send the second attribute value to the diagnostic interface, wherein the second attribute
4 value previously configured the at least one configurable attribute.

1 Claim 3. (original) The device of Claim 1, wherein the configuration memory is
2 further adapted to store a second attribute value that configures a second configurable attribute;
3 and wherein the second mode of the diagnostic controller does not store the second attribute
4 value in the configuration memory, wherein the second configurable attribute is unassociated
5 with the I/O connection.

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1 Claim 4. (original) The device of Claim 3, wherein the configuration memory
2 comprises a I/O configuration memory adapted to store the first attribute value and a core
3 configuration memory adapted to store the second configurable attribute value.

1 Claim 5. (original) The device of Claim 2, wherein the I/O configuration memory
2 comprises a shift register adapted to shift in and store the first attribute value and to shift out and
3 output the second attribute value.

1 Claim 6. (original) The device of Claim 1, wherein the diagnostic interface
2 comprises a serial data connection.

1 Claim 7. (original) The device of Claim 6, wherein the serial data connection is
2 adapted to receive a second I/O value from an I/O connection of a second device and to send the
3 second I/O value to a third device.

1 Claim 8. (original) The device of Claim 7, wherein the diagnostic interface is a
2 JTAG interface.

1 Claim 9. (original) The device of Claim 1, further comprising:
2 a configuration interface adapted to receive a set of attribute values for a set of
3 configurable attributes of the device from a configuration device; and
4 a configuration controller adapted to store the set of attribute values in the
5 configuration memory, thereby configuring the set of configurable attributes of the device.

1 Claim 10. (currently amended) The device of Claim 9, wherein the set of
2 attribute values include a second attribute value configuring the configurable attribute of the I/O
3 connection;

1 Claim 11. (original) The device of Claim 9, wherein the second mode of the
2 diagnostic controller disables the configuration controller.

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1 Claim 12. (original) The device of Claim 9, wherein the configuration controller
2 is further adapted to receive a signal and to retrieve the set of attribute values in response to the
3 signal.

1 Claim 13. (original) The device of Claim 12, wherein the signal is received from
2 a source external to the device.

1 Claim 14. (original) The device of Claim 12, wherein the signal is received from
2 the diagnostic controller.

1 Claim 15. (original) The device of Claim 14, wherein the diagnostic controller
2 further includes a third mode for receiving a configuration instruction from the diagnostic
3 interface and generating the signal in response to the configuration instruction.

1 Claim 16. (original) The device of Claim 15, wherein the diagnostic controller
2 further includes a pulse generator for generating the signal.

1 Claim 17. (original) The device of Claim 1, wherein the device is an integrated
2 circuit.

1 Claim 18. (original) The device of Claim 1, wherein the device is a
2 programmable logic device.

1 Claim 19. (original) The device of Claim 1, further comprising:
2 a system having a plurality of devices connected with the device.

1 Claim 20. (original) The device of Claim 19, wherein the system further includes
2 a configuration device.

1 Claim 21. (original) The device of Claim 1, further comprising:
2 a circuit board having a plurality of additional devices mounted thereto, such that
3 the device is connected with at least one other device on the circuit board.

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1 Claim 22. (original) The device of Claim 21, wherein the circuit board further
2 includes a configuration device.

1 Claim 23. (currently amended) A device comprising:
2 an I/O connection that is reconfigurable with respect to a plurality of configurable
3 attributes and adapted to communicate an I/O value;
4 a set of configurable attributes defining the function of the device and
5 configuration of the I/O connection;
6 a configuration memory adapted to store the set of attribute values configuring the
7 configurable attributes;
8 a configuration interface adapted to receive the set of attribute values from a
9 configuration device; and
10 a configuration controller adapted to store in the configuration memory the set of
11 attribute values received by the configuration interface in response to a configuration signal;
12 ~~thereby configuring the set of configurable attributes of the device wherein the set of attribute~~
13 values configure the set of configurable attributes of the device and the I/O connection;
14 a diagnostic interface adapted to communicate the I/O value of the I/O
15 connection; and
16 a diagnostic controller having a first mode adapted to communicate the I/O value
17 between the I/O connection and the diagnostic interface and having a second mode adapted to
18 send the configuration signal to the configuration controller.

1 Claim 24. (original) The device of Claim 23, wherein the diagnostic controller is
2 further adapted to receive the configuration instruction from the diagnostic interface and to send
3 the configuration signal to the configuration controller in response to the configuration
4 instruction.

1 Claim 25. (original) The device of Claim 23, wherein the diagnostic controller
2 further includes a pulse generator for generating the configuration signal.

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1 Claim 26. (original) The device of Claim 23, wherein the configuration
2 controller is further adapted to receive the configuration signal from a source external to the
3 device.

1 Claim 27. (original) The device of Claim 23, wherein the device is an integrated
2 circuit.

1 Claim 28. (original) The device of Claim 23, wherein the device is a
2 programmable logic device.

1 Claim 29. (currently amended) A method for configuring an attribute of an I/O
2 connection of a reconfigurable device comprising:
3 receiving a diagnostic instruction from a diagnostic interface;
4 communicating an I/O value from the I/O connection to the diagnostic interface
5 when the diagnostic instruction is of a first type;
6 receiving an attribute value from a plurality of attribute vales associated with the
7 attribute of the I/O connection from the diagnostic interface when the diagnostic instruction is of
8 a second type; and
9 storing the attribute value in a configuration memory, ~~thereby configuring the I/O~~
10 ~~connection, wherein the I/O connection is configured from a first state to a second state in~~
11 response to the attribute value when the diagnostic instruction is of the second type.

1 30. (original) The method of Claim 29, wherein storing the attribute value
2 comprises:
3 shifting the attribute value into a shift register;
4 shifting a previously stored attribute value of the I/O connection out of the shift
5 register; and
6 communicating the previously stored attribute value with the diagnostic interface.

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1 Claim 31. (original) The method of Claim 29, wherein the diagnostic interface
2 comprises a serial data connection.

1 Claim 32. (original) The method of Claim 29, wherein the diagnostic interface is
2 a JTAG interface.

1 Claim 33. (original) The method of Claim 29, further comprising:
2 receiving a configuration signal via the diagnostic interface;
3 retrieving a set of attribute values defining the function of the reconfigurable
4 device from a configuration device via a configuration interface in response to the configuration
5 signal; and
6 storing the set of attribute values in the configuration memory, thereby defining
7 the function of the reconfigurable device.

1 Claim 34. (original) The method of Claim 33, wherein the set of attribute values
2 includes a second attribute value associated with the attribute of the I/O connection.

1 Claim 35. (original) The method of Claim 33, wherein receiving the
2 configuration signal, retrieving the set of attribute values, and storing the set of attribute values
3 are disabled when the diagnostic instruction is of the second type.

1 Claim 36. (currently amended) A system having a plurality of devices, the system
2 comprising:
3 a reconfiguration device having a stored set of device attributes;
4 a reconfigurable device having a set of configurable attributes and adapted to
5 receive the stored set of device attributes, thereby configuring the reconfigurable device; and
6 a diagnostic interface adapted to interface with the reconfigurable device and with
7 an external testing device, thereby communicating an I/O value associated with an I/O
8 connection of the reconfigurable device to the external testing device, wherein the I/O
9 connection is reconfigurable in response to one or more of the stored set of device attributes;

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10 wherein the reconfigurable device includes a configuration controller adapted to
11 initiate the reception of the stored set of device attributes in response to a configuration signal,
12 and a diagnostic controller having a first mode adapted to communicate the I/O value between
13 the I/O connection and the diagnostic interface and having a second mode adapted to send the
14 configuration signal to the configuration controller, wherein the I/O connection is reconfigured
15 in response to at least one of the device attributes.

1 Claim 37. (original) The system of Claim 36, wherein the diagnostic controller is
2 further adapted to receive from the diagnostic interface a second set of device attributes adapted
3 to configure the reconfigurable device.

1 Claim 38. (original) The system of Claim 36, wherein the diagnostic controller is
2 further adapted to send the configuration signal to the configuration controller in response to a
3 configuration instruction received from the diagnostic interface.

1 Claim 39. (original) The system of Claim 36, wherein the configuration
2 controller is further adapted to receive the configuration signal from a source external to the
3 device.

Claim 40. (original) The system of Claim 36, wherein the diagnostic interface is
a JTAG interface.